

1. Project Summary (anonymized)

1.1 Objectives

We propose to deliver fully virtual training cohorts for the NASA TOPS OpenCore training curriculum with a highly qualitative component throughout the training. We propose five 6-week Virtual Cohorts per year, for 3 years, that will include guided reflection and hands-on implementation of open science concepts, processes, and techniques. This program will teach one OpenCore Module per week, by bringing in expert speakers from across different scientific domains, allowing learners to actively embed their training in their work and reflect on their learning with a mentor.

1.2 Methods

The proposed training will require approximately 4 hours of personal commitment per week. This includes a mix of online training from domain experts to cover the 5 TOPS OpenCore modules, discussion groups to explore use cases, hands-on work applying open principles, methods, and techniques to a trainee's work, and 1:1 mentoring. Pedagogy training will ensure that people who participate in the training become ambassadors and "multipliers", equipped with the right competencies to pass on their knowledge and skills. Mentors have hands-on experience as open science practitioners, and are provided professional coaching training to ensure that participants are effectively guided through their open science journey.

Additionally, community immersion will be facilitated via Slack, where cohort participants, mentors, and experts will be able to interact before, during, and after the 6-week program.

1.3 Significance of the Proposed Work

This proposal advances open science literacy among a wide and diverse scientific community, including people from historically underrepresented and marginalized communities. The proposed mentoring and training aims to allow individuals and teams to integrate open and equitable practices to disseminate their work, as it is designed to fully engage and embrace a multiplicity of talents, ideas and perspectives. Inclusion by design is one of the core actionable principles we strive to follow and advocate for. We see open science literacy as deep understanding and adoption of approaches and techniques but also of principles and thus aligns closely with NASA TOPS objectives and priorities.

Our communities welcome a large number and wide variety of scientists and researchers, from undergraduate students to senior practitioners. In this context, we

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make explicit efforts to center an ethics of care, encouragement and support in the community setting that benefits everyone, newcomers but also experienced scientists. An example of such commitment is the microgrants, which have been provided to cohort participants to support and encourage their engagement in the community effectively.

The principle of mutual help is centerstage. We are ready to provide scientists with the help, encouragement, and equal access needed for completing the OpenCore curriculum, earning their badge and making the Virtual Cohorts a success.

This application proposes the training in English-language. It complements another proposal that is Spanish-language first.

2. Scientific/Technical Management (10 page limit)

2.1. Introduction

Culture change in academia is hard, and many initiatives to change the research environment come from grassroots-founded organizations, created by academics who wished to see research culture shift towards being open and equitable [1], [2]. Grassroots efforts are one part of the equation; the other part is the support from funders, policymakers, and journals. We propose to train scientists, researchers, and research-supporting staff at all career stages to become advocates of this change. This will push academic culture away from seeing open science as an “extra” that is important but ultimately deprioritized because it takes time and does not reap immediate rewards. [3]–[6] By embedding open science practices into day-to-day scientific work, our goal is to transform towards responsible open sharing as the bare minimum a scientist should carry out, similar to the way science views papers and peer review: an essential part of the scientific process.

2.2. Objectives and Expected Significance

Objective 1: Train at least 5 rounds of ~50 people per cohort per year for 3 years (750 to 1,050 participants). Each cohort will receive 6 weeks of online training covering the 5 NASA Transform to Open Science (TOPS) OpenCore modules (in English).

Objective 2: Steward a supportive and inclusive online community around NASA TOPS training. Offering the TOPS OpenCore in a systematic manner by combining theory with practical work on participants’ own projects and real-world examples is essential for building critical understanding of open science. Building diverse inclusive cohorts will provide participants with the opportunity to ask questions in a supportive environment and apply learned practices to their work.

Objective 3: Skills are retained, re-used, and shared onwards. Rather than short-form training devoid of a strong community around it, the proposed 6-week Virtual Cohorts provide opportunity for learning and hands-on implementation of open science. Community-based training allows for continued engagement beyond the 6 weeks of the program, allowing meaningful involvement of USA scientists in the global open science movement.

Objective 4: Create a “multiplier” effect. In order to enable training and the building of an inclusive open science community, actions taken in Objectives 1, 2, and 3 will be further facilitated by pedagogical and movement building training for participants and mentors, so that after they have completed the course, they become open science champions mentoring others and embedding good practices in their labs and institutions. This is elaborated further in the impact section.

This application complements another proposal, but this proposal is English-language first.

2.3. Impact of Proposed Work

Our training is designed to embed practical, attainable real-world skills into daily work, rather than just theoretically teaching participants about best practices that are difficult to realistically achieve. By offering participants “quick wins” that are easy to implement, alongside ways to easily share their new-won knowledge, we intend to create open science ambassadors who are supported to spread open science skills to colleagues and collaborators, including those who have not yet participated in a cohort or completed OpenCore badges.

This is achieved not only by participants completing the training, but also engaging throughout the 6 weeks of a virtual cohort through a project of their interest, with time for weekly reflection while being guided by a professional mentor who can offer 1 on 1 support to achieve the cohort program objectives. Finally, all engaged participants who are likely to be capable mentors are encouraged to participate in the program in future rounds as mentors, helping to embed these skills even more deeply, and passing on their new-found skills.

By focusing significant effort on marginalized and lower-resource communities, we hope to not only act as Allies (allies are people with more privilege or power in a situation who support and elevate others with less privilege – often from marginalized groups or identities), but also as role models for how equitable collaborations in open science can be created, without exclusion, tokenization, exploitation, or extractivism. [7], [8]

2.4. Relevance of Proposed Work to Announcement

TOPS Goal: “Increasing understanding and adoption of open science.” We will advance open science literacy among a wide scientific community. Our proposal has a goal of allowing open and equitable communities to disseminate their work, as it is designed to fully engage and embrace a multiplicity of talents, ideas, and perspectives. Open science literacy means building deep understanding and driving adoption of approaches, techniques, as well as principles.

TOPS Goal: “Accelerate major scientific discoveries.” Open science accelerates scientific discoveries and innovation [9]–[12]. By training and stewarding a community of between 750 and 1,050 new open science ambassadors, we will increase open science literacy, which will serve the ultimate goal of accelerating scientific discoveries.

TOPS Goal: “Broaden the participation in SMD-funded research by historically under-represented communities.” Inclusion by design is one of the core actionable principles

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we advocate for and implement in all our work. Many researchers struggle to find right avenues to reflect on taught skills in the context of their own work, which our personalized mentoring approaches effectively address. Virtual cohorts with specific accessibility measures make it equitable for people with a broad range ability and disability to engage with training in open science.

The ethic of mutual help and collaborative spirit is centerstage for us. We are experienced at successfully providing the help, encouragement, and equal access that scientists need to complete OpenCore modules, earn their badge, and, therefore, for the Virtual Cohort-based training to be a success.

2.5. Approach and Methodology

Open-science-curious researchers, from undergraduates to senior practitioners, will be asked to commit 4 hours a week for 6 weeks. Learning materials, synchronous Zoom calls, and all interactions will be online with inclusive and accessibility measures. This will be a mix of online training from domain experts to cover all TOPS OpenCore modules, discussion groups to explore use cases, hands-on work applying open principles and techniques to trainee's work, and 1:1 mentoring.

All cohort facilitators will be offered professional-quality training on coaching and pedagogy for delivering online training. Mentors will be experienced open science practitioners, with professional training in mentoring skills. Asynchronous interactions and community engagement will happen via Slack workspace where cohorts' mentors, experts, organizers, and other open science practitioners will be able to interact before, during, and after the 6-week program.

2.5.1. Detailed Plan for the Virtual Cohorts

Size	Average of <u>50 participants per cohort</u> , formed of self-selected team projects and individuals. Capped at 70 participants total.
Location	Zoom-based online collaboration, Slack, mailing lists.
Duration	<u>6 weeks</u> per cohort, 5 cohorts per year.
Scheduling	Up to <u>4 hours per week</u> for participants, including 2.5 hours of cohort call each week, a 30 minute 1:1 mentor discussion, and reflection time.
Cost	Individuals \$700, Groups of 2-5: \$1,200. Equity access: no-quibble fee waivers for anyone who asks, and microgrants to support participation.

Duration and size: We propose to run five 6-week Virtual Cohorts per year for three years, teaching one OpenCore module per week, with a final “graduation” week where participants share their learnings and how they’ve applied them to their work practices (Figure 1). Except for the final year, cohorts will not run in July (Summer break) and the end of December (Winter break). See Figure 2 for the complete virtual cohort schedule.

Cohort timeline		Before the course			Week						
		8 weeks	4 weeks	2 weeks	1	2	3	4	5	6	
Pre-cohort	Application period opens	x									
	Application period closes		x								
	Applicants notified			x							
TOPS OpenCore module 2.5 hours each	Ethos				2:30						
	Data					2:30					
	Software						2:30				
	Results							2:30			
	Tools & Resources								2:30		
Final Graduation	Group live-streamed presentations									2:30	
Mentor (30 mins)	1:1 or 1 mentor:group project				0:30	0:30	0:30	0:30	0:30		
Reflection & implementation	Self-led by participants - optional assignments - prep for final presentations				1:00	1:00	1:00	1:00	1:00	1:00	1:30
	Weekly hours				4:00	4:00	4:00	4:00	4:00	4:00	4:00

Figure 1. Detailed visualization of participant time commitments during the virtual cohort

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have a sufficient budget to also pay our mentors, call hosts, and other community participants an honorarium for their services, we have planned for approximately 50% of each cohort to pay for their training, and up to 50% will be offered no-quibble fee waivers upon request. As such, fee-paying groups of 2-5 will be able to participate for approximately \$1,200 per group and individuals will pay \$700 per individual. This fee structure seeks to incentivize participants to apply in small groups, as we have seen researchers learn about open ways of working best when practicing them through peer-to-peer interaction [14], facilitated within small groups during their training.

We will closely monitor this fee structure and adjust it if needed to ensure we get a diverse and representative group of participants across protected classes such as race, sexuality, disability, socioeconomic background, and gender.

Participants will be welcome to join even if they have already completed badges for one or more of the individual modules. They will be permitted to skip weekly calls for badges they have completed, but we will still encourage them to join and participate in order to form network ties and participate in breakout discussions with others in their cohort.

Feedback and iteration: As shown in Figure 2 we will start by preparing cohort logistics and setting out expectations for the first virtual cohort. This includes training mentors and experts in the specifics of OpenCore materials, forming template emails, meeting notes, application forms, and information for cohort members (including participants, mentors, and trainers) so they can have a clear understanding of the time commitments required. After these preparations, we will run a first cohort that will be a pilot for the next 14 virtual cohorts.

Concurrently with the setup of the inaugural cohort, we will recruit mentors, trainers, and experts from our extended open science networks, and particularly inviting mentor applications from people who authored the original OpenCore material [15].

Project governance will be driven not only by the PI and Co-Is, but also directly by the community. As a group, we will create team working principles, governance process, and conduct expectations by community consensus, including a framework for conflict resolution, and how decisions are made, as a community rather than top-down. To this end, we will adapt the processes used successfully by other community-based organizations to design their governance. [16] This will allow us to avoid inadvertent tokenization, and intentionally build a healthy community around the materials and subject matter.

2.5.2. Risks and Mitigations

Risk: OpenCore modules are not still public. It is risky to offer training for a material that is unknown

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Mitigation: Part of our team has access to and has participated in the development of OpenCore materials. On October 11th, Dr. Gentemann, TOPS Program Scientist, praised these materials using the following words “we [referring to NASA] are really happy with all that [material]. Every time I read it, I feel like I learn something new because it brings this global perspective and deepens my experience about open science. I think it is absolutely wonderful” (Quoted at 1:50:28 in [17]). In the interim, we are relying on outputs from OpenSciency, as deposited on Zenodo [18], for our expectations of what the materials might look like as well as the organisations’s own training materials that cover OpenCore topics.

Risk: Insufficient mentors recruited.

Mitigation: Mentors are usually community members external to our organizations with experience in Open Science practices. To help mentors prioritize their workload, we offer honorarium payments. If needed, staff of the proposing organization can perform the role of mentor internally. After the inaugural round of training, however, we will recruit more mentors from the previously graduated cohorts, so we anticipate this would not be a longstanding challenge.

Risk: Insufficient virtual cohort applicants

Mitigation: This risk is unlikely: we have calculated our cohort participation estimates based on the historic cohort participation of other online virtual open science training courses [13]. We will work with the TOPS team to ensure that the announcements of each cohort are on time and to the right target groups.

2.6. Management Structure

Inclusion is at the core of our working practices, so much of our plan for coordination and governance revolves around the community, taking a transparency-first and community-driven approach. This proposal is created by two organizations’ teams who have been regularly working hand-in-hand since early 2020, and have shared visions and values. We will begin by creating temporary team governance structures for the kickoff of the project, but as part of our project ramp-up, we will ensure we set up a team charter, governance structure, and decision making process, co-created with stakeholders, including NASA (where appropriate), and researchers representing various different career stages and backgrounds.

This governance system will be specifically designed to act as a system of checks and balances on our openness, our pedagogy, and our inclusion. We regard this open community governance as an essential part of embodying the behaviors we wish to teach around the benefits of open collaborative work. These governance policies and procedures will be online and open from the point of initial development, even when in

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“draft” format, unless personal protection is needed, for example in Code of Conduct enforcement settings.

Open communities, however, do not run alone without people power. Our dedicated staffing team and Co-Is will coordinate the day-to-day running of the cohorts and the governance processes, using the same processes and procedures we intend to teach as part of TOPS OpenCore. Our planned reflection and iteration time will apply not only to course content, but also to management, processes, and governance.

2.7. Description of Contributions

PI will be responsible for: the operations planning to complete all deliverables in due time and managing the team, all hiring, expense authorization, reporting, achieving our equal access goals, and measuring the impact of the virtual cohorts.

Co-I 1 will work hand-in-hand with the PI leading cohort operations and coordinating strategic vision between leadership and management.

Co-I 2 will focus on the financial management of the cohorts, including microgrant participant support policies, accounting and financial reporting for cohort income, and data protection.

Co-I 3 will be in charge of providing any required infrastructure for the cohorts (alongside Co-I 4 and Co-I 5) by recruiting from and nurturing marginalized communities.

Co-I 4 will be in charge of running the cohorts together with Co-I 3 and Co-I 5, particularly working on all aspects related to the accessibility of virtual cohorts.

Co-I 5 will be responsible for coordinating cohorts. Responsibilities include managing applications, matching mentor/mentee pairs, arranging weekly expert speakers to deliver the OpenCore material, nurturing the community, and virtual cohort weekly communications.

The whole team will work together to measure the project’s impact and openly share its results with the scientific community.

3. References

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4. Open-Source Science Development Plan

4.1 Virtual Cohort Training Program

All training outputs will be made publicly available as they are created. Individual calls have both blank “call templates” and completed post-meeting call notes, which will be deposited online on GitHub and Zenodo, under a CC-BY 4.0 license. Slides from presentations are deposited on Zenodo. The calls are recorded, except for private group discussions in breakout rooms. All recordings are deposited on YouTube, again with a CC-BY license and manually reviewed English transcriptions to facilitate hearing, screen-reading and language accessibility. Where code and scripts are used to manage the program, all code content will be stored on GitHub under a permissive OSI Licence, CFF (citation file format) metadata, and will be deposited on Zenodo. Code content is accompanied by detailed documentation such that others can contribute to it. We also teach and encourage all project leads to license their project output under a CC-BY/permissive OSI license, and to document their work and plans openly and inclusively.

4.2 Virtual Cohort Program Impact Measurement

We will measure the impact of virtual cohorts. The impact study will produce data which will be in the form of survey responses. We will share the survey protocols and methods openly on protocols.io or another relevant open service, including recruitment advertisements and survey questions. The study has been approved by an academic board for responsible research conduct.

Where ethically appropriate and safe we will share impact study response data anonymously or aggregated, as permitted by participants’ consent. Raw data will be stored securely on cloud-based servers (such as dedicated Dropbox for Business or GSuite) until processed (i.e. anonymized where necessary). Raw data will be retained for a minimum of five years unless ethics review or institutional repository requirements stipulate otherwise.

Once processed, data will be deposited on an open repository such as Zenodo or Dryad, alongside metadata “README” files that describe the shape of data and the meaning of specific columns.

Where possible, data will be stored in re-usable formats, i.e. CSV and JSON rather than proprietary formats, to facilitate re-use without the need for expensive or proprietary software.

We may use codes and scripts to analyze data, tidy the data, and produce visualizations for reporting and communications. Where this occurs, the scripts and clear running

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documentation and dependency data will be stored on GitHub under a permissive OSI license, and versioned snapshots of the code will be deposited on Zenodo.

4.3 Results Dissemination

In addition to sharing the data, protocol, and scripts, we will ensure that all publications associated with our impact study and training program are posted as preprints to facilitate early comment and distribution, and finally in open-access journals.

4.4 This Proposal

This proposal will be deposited on Zenodo to get a DOI as well as shared via the Open Grants portal (<https://www.ogrants.org/>).

5. Equal Access Plan

Positive and inclusive virtual events: Senior staff in this project are highly experienced in inclusion related techniques (as recommended by [21], [22]). We will:

- **Anticipate accessibility needs:** applicants will be asked how their participation can be facilitated. Their needs will be assessed, processed according to accessibility profiles [16] and tackled based on individual requirements.
- **Language:** English predominance excludes those who do not speak English as their first language from learning and contributing to science, including open science [22]. We have experience providing basic language inclusion by matching mentor/mentee pairs with language considerations in mind, which may improve accessibility for scholars who are first/second generation immigrants. If we have many participants preferring to engage in a non-English language, we will arrange high-quality live interpretation from/to that language for better accessibility for everyone.
- **No-quibble fee waivers** for participants who otherwise would not be able to join.
- **Microgrants for cohort participation:** A budget of around \$1,000 per cohort will be available for participants who might need assistance with costs towards a headset, ring lighting, high-speed internet, a webcam, childcare, accessibility, or other similar needs. Any surplus rolls over to future cohorts. We have experience making the use of these funds easy for recipients (e.g., transferring amounts needed ahead of time rather than reimbursing, minimal administrative layers and red tape). From our experience, this mechanism enables higher uptake for participants who are often marginalized, and creates a deep belonging to cohorts.
- **Hearing disability and language inclusion in online calls:** We will follow best practices for disability and language inclusion. Using real time AI-based captioning during all cohort calls, we will facilitate participation of those for whom English is not their first language, those who are deaf or hard of hearing, and those with ADHD.
- **Visual impairment and accessibility:** All training materials will use images with descriptive alt text for screen readers, and we will use visual-impairment consultancy recommended tooling for collaborative documents based on recommendations such as Web Content Accessibility Guidelines (WCAG) [24] and AbilityNet [25].
- **Ad-hoc access to training module calls:** We recognize that equal access to training also means flexible timing, as “free” time in itself is an unequally distributed resource [26]. All training calls will be recorded (excluding breakout rooms) and uploaded to a YouTube channel, so participants can catch up if they are unable to make the fixed training call timings or if their internet connection failed during the call. Automatic transcriptions will be error-corrected before upload [20] and online ad-hoc drop-in sessions will be offered for those unable to make the live calls.
- **Diverse leadership, staff, instructor, and mentor teams:** People are more likely to see themselves as members of a community if there are others like them [27], [28]. Our instructors and call hosts come from a variety of backgrounds and career paths.

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- **Building a sense of community via shared ownership:** Once participants have participated in one cohort, those assessed as ready by their mentors will be invited to become mentors. Mentors are paid an honorarium, to ensure that those who are more time-poor are still able to prioritize mentoring if they wish to.

Training: Mentors and staff will all participate in Ally Skills and Bias and Inclusion training, learning to recognize and use (when safe) their power and privilege to stand up for marginalized people. All online call facilitators are trained in inclusive techniques to work with people with diverse modes of communication, language skills, and ability/disability, covering visual and hearing impairments and general best practices.

Positive and inclusive working environment: The conduct guidelines apply equally to staff, as do our virtual inclusion plans. We also plan to follow good inclusion practices for recruitment and staffing [32]–[35].

Metrics: Reducing and avoiding overt and unconscious discriminatory bias is core for our proposal [33], [34]. Using metrics will allow us to observe inadvertent patterns and take decisive action to rectify them (implementing “bias interrupters” [35]). Our core measures include gender, sexuality, race, and disability, drawn from open source demographic standards [36], inclusion standards [37], and indirect metrics such as a participant’s education, income, and their parental education and income. All measures will comply with mandatory federal reporting standards for employees, and be optional but encouraged for participants and mentors. The indirect measures will be designed specifically to understand a participant’s family wealth and educational history, to take (legal and appropriate) affirmative action towards increasing not only diversity but indeed active participation from participants with lower-socioeconomic backgrounds.

As we have done in the past while stewarding virtual cohorts, we will use these metrics and feedback from participants to improve accessibility. For example, by (1) regularly reviewing our pricing structures and (2) providing microgrants, two tools to lower the economic barrier, one of the main access deniers.

Conduct principles: Our code of conduct (CoC) and participation guidelines will be initially based on the Todo group’s [38]. Once mentors, experts, trainers, and staff are onboarded, we will hold workshops to develop community-derived practices, utilizing recommendations from organizations such as Otter Tech, CoC violation response experts [39], and the Carpentries [40]. Multiple named reporting options are provided in case the reported is themselves a CoC reporting contact. The response(s) will consider: (1) likelihood of re-offense; (2) danger to community (if any) due to inaction or overharsh action; and (3) effects of investigation on reporter(s) and reported. Prompt response is key for community’s safety and wellbeing [41]. Equally, however, we commit to not employing such haste that people are inadvertently hurt during the process.

6. Table of Personnel and Work Effort

Role	Commitment (FTE)			
	Y1	Y2	Y3	Total
PI	0.3	0.3	0.25	0.85
Co-I-1	0.15	0.15	0.15	0.45
Co-I-2*	0	0	0	0
Co-I-3	1.0	1.0	0.95	3.0
Co-I-4	0.05	0.05	0.05	0.15
Co-I-5	0.6	0.45	0.45	1.5
Support staff	0.08	0.08	0.08	0.24
Total funded work effort	2.18	2.03	1.93	6.14

* Co-I 2 will have a 0.04 FTE commitment each year that will not be funded by this proposal

7. Budget Justification: Narrative and Details

This grant and its sister grant application are designed to complement each other. Whilst both applications are capable of standing alone, we *do* anticipate that having both at the same time would facilitate significantly more efficient operations, that would likely result in higher-quality delivery across the two programs. This would create higher-quality engagement, community-driven supplemental content, and communal mingling between the English-language and Spanish-language communities we hope to host.

7.1 Salary

PI will spend 25-30% of their time leading and overseeing the execution of the project. This includes (1) supervising and managing 2 program coordinators; (2) project management; (3) overseeing all hiring, expense authorization, reporting and other NASA interaction processes; (4) measuring and monitoring the project’s progress towards the equal access goals and overall impact; (5) oversee the responsible use of data to improve virtual cohorts’ daily operations; and (6) operationalize the project team’s commitment to inclusion and ethical operations.

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The PI's time commitment decreases in the third year as operations become more routine and their supervisees' time commitment on the project decreases.

Co-I-1 will spend 15% of their time working with PI to (1) lead and oversee cohort operations, including supervisor 1 program coordinator, (2) coordinate strategic vision between project leadership and staff, (3) setting up governance for cohort training and open science immersion, and (4) ensuring that an inclusive work environment and management structure for the project team is established and documented.

Co-I-2 will spend 4% of their time on the financial management of cohorts, including (1) setting up and maintaining microgrant, honoraria, and other appropriate financial policies, (2) monitoring participant and fee-waiver numbers, (3) updating pricing where necessary, and (4) working with support staff member in accounting and financial reporting for cohort income. *Co-I-2's time is funded by charging some cohort participants (more information about costs not funded by this proposal in the detailed budget), and not by this proposal.*

Co-I-3 will spend 95-100% of their time working with Co-I-4 and Co-I-5 in ensuring the successful delivery of the cohorts' activities, by (1) setting up and maintaining the necessary infrastructure and processes, (2) creating community documentation and signposting resources as necessary, (3) recruiting participants and nurturing and building an inclusive community of cohort participants, and (4) working with Co-I-5 to measure the project's impact and share these results openly with the scientific community.

Co-I-4 is the accessibility expert of the project. They will spend 5% of their time in (1) addressing accommodation requests from cohort participants, (2) checking the accessibility of virtual cohort materials, (3) procuring appropriate services to improve cohort accessibility, and (4) monitoring the accessibility of virtual cohorts and the impact of accommodation measures.

Co-I-5 will spend 45-60% of their time working with Co-I-3 and Co-I-4 in (1) establishing frequent communication with participants and providing timely responses to questions, (2) liaising with mentors, experts, and other partners to ensure successful delivery of the curriculum, and (3) working with Co-I-3 to measure the project's impact and share these results openly with the scientific community.

We expect the first year to require more time commitment from Co-I-3 and Co-I-5 because of the need to set up basic infrastructure and processes. As cohort operations become routine, coordinators will be more efficient by reusing resources from previous cohorts and hence time commitment will decrease.

1 support staff member will spend 8% of their time handling the day-to-day financial administration of the virtual cohorts, including (1) administering mentor and expert honoraria and participant support microgrants, (2) handling cohort participants' payments, (3) administering no-quibble fee waivers to ensure equal access to program, and (4) working with Co-I 2 in accounting and financial reporting for cohort income.

7.2 Fringes

Retirement plan and health insurance will be paid pro-rated for all salaries.

7.3 Equipment

3 Laptop packages including headphones, keyboards, Mice, and other necessary peripherals will be purchased for the project coordinators. The equipment will be used by Co-Is for running the virtual cohort calls and day-to-day administration of the cohorts. We expect such packages to cost \$1800 – the aim here is to ensure that the coordinators have the equipment required to perform their best work.

We expect to purchase 2 laptop packages in the first year, and the final one in the second year as we have one existing package that is likely to need replacement in year 2.

7.4 Travel

Funds for PI (or in the case of a scheduling conflict, a co-PI) of the project to participate in one (in year 1) or two (in year 2) international conferences on aerospace research and/or open science to present this project work to a global audience and foster further collaborations. Examples of such conferences could be CarpentryCon, csv,conf, American Geophysical Union Meeting, and the International Aeronautical Congress.

- Destination: TBD, likely Europe or Asia
- Number of days: 5
- Airfare: \$1400
- Per diem: \$300, including lodging and meals
- Miscellaneous travel expenses: \$100, including local transportation both at destination and at origin

We budget for two foreign conferences in year 3 as we see an increased opportunity to share the outcomes and impact of this project in the final year.

In addition, the PI will travel to Washington D.C. to meet with the NASA TOPS team annually. The funds for these annual trips are not included in our proposal budget as

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based on our past experience, federal agencies cover the expenses for these trips (see Table 1. detailed budget for more information).

7.5 Participant/trainee Support Costs

Honoraria will be offered to program advisors and members from our community to support their involvement and participation in setting up and taking part in operational and management activities for the project. Meaningful and effective governance and mechanisms for community accountability are crucial to the success of the project, and to facilitate the building and operation of meaningful decision-making, a governance/advisory team needs to have diverse representation from within our community. In our experience, offering honoraria helps facilitate participation in leadership roles such as related to governance activities, particularly for traditionally marginalized groups. The total cost for honoraria provision is provided in the NSPIRES cover page budget in Section E line 5. All costs in that line are labor and thus not shown here, consistent with ROSES rules regarding redaction.

The following costs are not included within the grant budget but are instead covered through charging some cohort participants (please see Table 1. detailed budget for more information). All exact amounts for honoraria are related to labor and hence redacted here consistent with ROSES rules regarding redaction.

Microgrant for participants – for each cohort, \$1000 will be available for participants who might need assistance with costs towards a headset, ring lighting, high-speed internet, a webcam, childcare, accessibility, or other similar needs. In our experience with microgrants, this mechanism enables higher uptake for participants who are often marginalized, and creates a deep belonging to cohorts. We expect these costs to increase due to global inflation across the three years of the project, hence the microgrant budget grows by 8% between each year.

Honoraria for mentors – an honorarium is offered to each participating mentor. Mentors play a vital role in guiding cohort participants through the program. We expect mentors to volunteer at least 6 hours of their time in each cohort.

Honoraria for experts – an honorarium is offered to each participating expert. Experts share their knowledge and expertise through presentations and Q&A sessions during cohort calls. We anticipate experts to volunteer 5 hours of their time to prepare for their presentation and to attend the cohort call where they'll be presenting.

Honoraria for call hosts – an honorarium is offered to each call host. Call hosts play a crucial role in facilitating cohort calls and ensuring their smooth running. We expect

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each cohort call to have one call host, and each call host to contribute 2.5 hours of their time (to participate in the cohort call).

7.6 Other Direct Costs

ADP/Computer services – \$1300 in the first year to cover fees for Eventbrite up front for the first cohort, which is used to handle ticketing for cohorts and processing payments from paying participants. From the second cohort onwards, we will cover this cost through the cohort charging structure.

Live interpretation services for cohort calls – To enable the simultaneous interpretation of 8 hours of expert talks per cohort from English to other languages (or vice versa) including American Sign Language, depending on the makeup of spoken languages and mix of abilities within the cohort. Year 1 is budgeted higher than subsequent years, as additional work may be required during setup and the pilot cohort. The total cost for live interpretation services is provided in the NSPIRES cover page budget in Section F line 8. All costs in that line are labor and thus not shown here, consistent with ROSES rules regarding redaction.

7.7 Indirect Costs

The hosting entity elects to charge a de minimis rate of 10% of modified total direct costs to cover costs related to the administration of this award.

Table 1. Detailed Budget

Costs to be funded by this proposal				
Budget period	1	2	3	Total
Start date	06/01/2023	06/01/2024	06/01/2025	
End date	05/31/2024	05/31/2025	05/31/2026	
A. Senior/Key Person	redacted in accordance with ROSES rules			
B. Other Personnel	redacted in accordance with ROSES rules			
Total Salary and Wages (A+B)	redacted in accordance with ROSES rules			
C. Equipment Description				
Laptop package 1	1,800	0	0	
Laptop package 2	1,800	0	0	
Laptop package 3	0	1800	0	

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Total Equipment (C)	3,600	1800	0	5,400
D. Travel				
Foreign travel	3,000	3000	6000	
Total travel (D)	3,000	3000	6000	12,000
E. Participant/Trainee Support Costs				
Honoraria for governance members	redacted in accordance with ROSES rules			
Total participant/trainee support costs (E)	redacted in accordance with ROSES rules			
F. Other Direct Costs				
Consultant Services	redacted in accordance with ROSES rules			
ADP/Computer services	1,300	0	0	
Live interpretation services	redacted in accordance with ROSES rules			
Total other direct costs (F)	1300	0	0	1300
Indirect rate	10%			
Costs proposed but NOT to be funded by this proposal				
A. Senior/Key Person	redacted in accordance with ROSES rules			
B. Other Personnel	redacted in accordance with ROSES rules			
Total Salary and Wages (A+B)	redacted in accordance with ROSES rules			
C. Equipment Description				
Total Equipment (C)	All equipment costs are funded by this proposal			
D. Travel				
Foreign travel	3000	3000	3000	
Total travel (D)	3000	3000	3000	9000
E. Participant/Trainee Support Costs				
Microgrants	5,000	5,400	5,832	
Cohort call YouTube processing support per hour	redacted in accordance with ROSES rules			

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Honoraria - mentors	redacted in accordance with ROSES rules			
Honoraria - experts	redacted in accordance with ROSES rules			
Honoraria - call hosts	redacted in accordance with ROSES rules			
Total participant/trainee support costs (E)	redacted in accordance with ROSES rules			
F. Other Direct Costs				
ADP/Computer services	5,290	7,117	7,687	
Total other direct costs (F)	5,290	7,117	7,687	20,094

Table 2. Participation and Ticket Pricing Estimates

From past experience of running cohorts, we expect 50 participants on average per cohort: 44% joining as individuals and 56% as groups of 2-5. We also expect 50% of participants to request a no-quibble fee waiver.

As illustrated in the table below, we calculated that ticket prices of \$700 for individual participants and \$1200 for groups should cover our cohort expenses. We describe a “lowest case” earnings from multiple large groups (as large groups pay less per participating person), and a “highest case” earning projection if multiple small groups participate. In reality, we expect it to be somewhere between the two.

We plan to run 5 cohorts per year throughout the duration of the project.

	Estimates	Min group size	Max group size
Number of participants	50	\$50	\$50
Joining as an individual (paying)	11	\$7,700	\$7,700
Joining as a group (paying)	14	\$8,400	\$3,300
Joining with no cost (individual)	11	\$0	\$0
Joining with no cost (group)	14	\$0	\$0
Fee for individual	\$700		
Fee for group of 2-5 individuals	\$1,200		
Total earnings per cohort		\$16,100	\$11,000